

**DOCKETED**

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Submitted On: 7/31/2020  
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**on Support**

*Additional submitted attachment is included below.*



Date: 7/30/2019

To:

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Re. Docket number: 17-EVI-01

Dear Commissioners:

This letter is being submitted to express strong support of requiring workforce training for the installation and maintenance of electric vehicle supply equipment (EVSE) that is installed under California Energy Commission programs or otherwise supported by state funding. EVSE is the technical term for electric vehicle (EV) charging stations and their associated infrastructure.

The safe and reliable installation of EVSE systems requires specialized knowledge and training. Installation of EVSE systems requires adhering to an extensive list of standards, electrical codes, and workmanship requirements. EVSE systems are complex, continuous load systems that have specific installation requirements related to proper wire sizing, overvoltage and surge protection, shutoff, and load management, with additional specialized requirements for categories such as DC fast chargers or heavy duty fleet charging systems. Article 625 of the California Electrical Code specifies required methods for wiring, equipment construction, and safety protection systems, among other requirements. Improperly installed EVSE systems and infrastructure can result in fire, explosions, electric shock, severe damage to chargers and cars, and other hazardous situations. Many EVSE-related fires are due to installers failing to properly inspect and assess the building electrical system and its ability to handle the load generated by the charging equipment.

In particular, this letter supports requiring installers of EVSE to have Electric Vehicle Infrastructure Training Program (EVITP) certification. EVITP is the only comprehensive training available for EVSE certification and is a well-established, regularly-updated national program. EVITP was developed in cooperation with manufacturers, utilities, training institutions, contractors and other EV industry stakeholders. This training is open to any California state-certified general electrician, can be completed in about 20 - 24 hours, and has been

successfully required by public agencies in California and other states. While California requires certified electricians to complete certain training in the fundamentals of electrical construction, the state certification does not include the specialized training needed to ensure safe and proper installation of EVSE. Indeed, California expressly mandates that certified electricians take continuing education in order to keep up to date on changing technology or to provide expertise in specialized areas. EVITP certification fits into this continuing education requirement and ensures that installers have the skills necessary to efficiently, safely and properly install these potentially hazardous power delivery systems.

This issue calls for action now, for a number of reasons, including:

- The installation of EVSE and associated infrastructure is not “plug-and-play” and is not simple or easy. Without proper advanced installation training, EVSE infrastructure has been, and will continue to be, linked to considerable hazard and risk.
- With state policy calling for 250,000 EVSE installations by 2025, the volume of installations is growing rapidly, increasing the likelihood of serious accidents due to improper installation as more and more inexperienced and undertrained workers perform this work.
- To enable greater range and broader buyer acceptance, EV batteries are getting more powerful and charging rates are becoming faster every year. This greatly increases load pressures on electrical systems and the risk of serious electrical shock or fire when systems are old, undersized, have faults, errors, or incompatible components.
- Public officials, electrical inspectors, building officials, firefighters, electrical contractors, training experts, advocates for the environment and environmental justice, community groups, public health organizations, school officials, and electric utilities are concerned about the safety of electric vehicle infrastructure as well as the public and commercial acceptance of EVs.
- California Air Resources Board rules passed for Zero Emission Buses and Clean Trucks are markedly expanding demand for larger numbers of heavy duty fleet charging system installations. Their more sophisticated technology, greater complexity, and high power further underscore the vital need for the advanced training and safety certification that EVITP delivers.

The concern for EVSE electrical and fire safety is neither “overblown” nor “alarmist”. The National Fire Protection Association (NFPA) reports that fires involving electrical failures or malfunctions accounted for the highest share of civilian deaths (18%) and direct property damage (20%). The reality is that all electrical equipment presents real and significant risks of fire and electrocution – but the risks posed by EV equipment is significantly greater than most electrical equipment due to the high voltage and the load stress that this equipment puts on the electrical systems of residential and commercial buildings. As EV batteries become more powerful and charging stations seek to push electricity into these batteries at faster and faster rates, often at higher voltages, these risks continue to heighten.

While circuit breakers are intended to help protect against load surges, they cannot fully mitigate these risks because they are not always reliable. Many buildings do not have the wiring condition or capacity to handle the increased loads of EVSE systems. According to the U.S. Fire

Administration (USFA), outdated or improperly maintained breaker boxes often have worn connectors that do not work, which create a risk that a system will overload and start an electrical fire. Circuit breakers will also not reliably protect against inadequate wire capacity which is a common cause of electrical fires. EVITP trains workers to inspect and evaluate the entire electrical system when installing EVSE to ensure not just proper installation of the equipment, but also that the EVSE will not overload the existing electrical system components. When people's health and lives are at stake, proper safety precautions and risk reduction are anything but overblown or alarmist - they are rational, prudent, and responsible.

These concerns become particularly heightened as California seeks to rapidly increase the number of EV charging stations in California. Without appropriate workforce training requirements, this rapid increase will lead to more and more contractors installing EVSE with undertrained, under-experienced installers. A CEC EVITP requirement will ensure that all installers of CEC funded or subsidized EVSE projects will have the proper training necessary to ensure safe and proper installation.

The Commission should also consider the threat that EVSE fires would have on the continued growth of the EV industry and public policy. There are tens of thousands of gasoline and diesel vehicle fires annually and they rarely if ever make the news. One EV related fire – even if there are no serious injuries – is front page news. While not fair, that negative publicity really hurts progress towards EV acceptance and meeting California's clean transportation goals. With report after report of consumer product batteries exploding and causing fires, the public is reasonably nervous about the safety of battery powered vehicles in their garages. What is more worrisome in terms of EV acceptance and growth is that there is much confusion in media reports and public understanding of "EV fires" and those caused by improper EVSE installation. EVITP not only reduces risks to building occupants, emergency responders and property, it also protects the reputation and integrity of the EV industry. With the growth of clean transportation so critical to meeting our clean air mandates, public health goals and GHG reduction targets, public acceptance of, and enthusiasm for, EVs is critical.

The best way to avoid the real and present danger of overloading building electrical systems is not to do it in the first place. The way to avoid such stress is to conduct a comprehensive and accurate site assessment and load calculations of the existing building's electrical system, and perform thorough code compliant work, before the additional loads of EV charging are connected. The Electric Vehicle Infrastructure Training Program (EVITP) trains and certifies California state-certified electricians to accurately and effectively perform those essential tasks and much more.

EVITP is a brand-neutral program that provides installers with the most comprehensive classroom and hands-on training available for EV infrastructure. EVITP was developed by a non-profit collaboration of EV industry organizations including automakers, manufacturers, educational institutions, utility companies, electrical industry professionals, and other key EV industry stakeholders. EVITP is open to all California state-certified electricians.

EVITP 4.0 EV infrastructure training includes residential, commercial, industrial and DC fast charging categories. Expert EVITP certified master instructors teach training modules covering electric vehicle instruction topics that encompass ADA construction requirements, battery types, specifications and charging characteristics; utility interconnection policies and requirements; utility grid stress precautions; site assessment and load calculations, charging station fundamentals; integration of EV infrastructure with distributed generation; the National Electrical Code and California Electrical Code, EV relevant electrical standards and requirements including NFPA 70E and OSHA regulations as well as National Electrical Installation Standards. Electricians must pass a rigorous proctored final exam to become EVITP certified.

EVITP is also well-established. The EVITP program was launched over 8 years ago at an EV industry meeting held at the University of Michigan in Ann Arbor. In California, EVITP has trained and certified over 1600 certified electricians in California alone. EVITP is regularly updated and is currently on its fourth generation curriculum.

In addition, EVITP has been successfully imposed as a requirement for numerous programs in California. SDG&E, for example, has installed over 3,000 electrical vehicle charging ports under its Power Your Drive Program with an EVITP requirement and has had no issues with electrician supply. EVITP is also included in the CPUC safety language, and required by the cities of Carson, Pico Rivera, and Long Beach as well as by the Port of Long Beach in an EPIC grant from the CEC. Moreover, EVITP is required for the EVSE infrastructure installations on the Nevada Electric Highway and in federally funded installations in Columbus Ohio – winner of the National Smart Cities award. EVITP is the only training program featured in the U.S. DoE Guides on EV infrastructure for public charging hosts, and for contractors. Most recently, EVITP was referenced in The Biden Plan To Build A Modern, Sustainable Infrastructure And An Equitable Clean Energy Future.

While a few manufacturers sponsor training programs, those programs are not comprehensive, vary widely in content, and are limited in scope to their specific equipment. EVITP is the only comprehensive, brand neutral, non-profit, low cost, EVSE infrastructure training and certification program in the U.S. and Canada. Only EVITP provides classroom and hands-on training, is verified with proctored exams, and provides for continuing education as EVSE technology evolves. Those are among the reasons EVITP is the only training program featured in the U.S. DoE Guides – there is no other comprehensive training available. If other equivalent training had been available, the Commission would have a history of also supporting that other training.

Because EVITP certification is tested and mature, there are now sufficient numbers of electricians with EVITP certification to meet California's needs. EVITP-Approved contractors are required to ensure that at least half of the state-certified general electricians on an EVSE jobsite are EVITP certified. However, the requirement exempts apprentices. This allows for crews of four consisting of one EVITP-certified electrician, one non-EVITP-certified electrician and two apprentices. That means that the 1,600 EVITP-certified electricians in California can provide a qualified workforce of up to 6,400 electrical installers. For 1,600 crews of 4 to install 250,000 charging systems over a three year period, each crew of four would install 156 charging systems – 52 each year. That is assuming that no additional electricians were certified. An

EVITP requirement, however, would drive enrollment and substantially increase the number of electricians with EVITP certification.

Those 1600 EVITP certified electricians are employed by 75 EVITP Approved electrical contractors in California (listed at EVITP.org). That is more than enough to ensure that every job gets multiple, competing bids. Some of these contractors are local, some regional, and some operate state-wide.

While the number of EVITP-approved contractors continues to steadily increase, the single most important and effective driver for expanding this number (and the number of EVITP certified electricians) is for EVSE incentives to be linked to EVITP requirements. Competitive bidding drives many contractors to operate on a low cost labor strategy that discourages investment in any certification training beyond what is mandated. In order to ensure that all contractors who might bid for work installing EVSE use properly trained workers, EVITP must be a requirement – not a mere recommendation. Imposing EVITP requirements now will create motivation for substantially more contractors to become EVITP-Approved, as EVSE installation ramps up across the state.

An EVITP requirement is also good for disadvantaged communities. Most new EVs are expensive but used ones are becoming affordable for most Californians. Charging stations are needed in disadvantaged communities but electrical equipment in stores, homes, and apartments in these communities tend to be older with electrical systems that may not be able to reliably and safely handle EVSE loads without proper installation and component upgrades. These communities deserve and require installation by properly trained EVITP-certified electricians in order to reduce the risk of structure fires and electrical hazards. Disadvantaged communities need and deserve the most competent and safest EVSE work.

From a workforce perspective, programs that have required EVITP certification for installers have continued to meet goals in regard to work opportunities for underserved businesses enterprises and communities. Southern California Edison (“SCE”), for example, evaluated the impact of its EVITP certification requirement for installation of electric vehicle charging stations in its Charge Ready program. It found that, even with this requirement, the participating contractors exceeded SCE’s goals for employing Diversified Business Enterprises. In addition, EVITP-Approved contractors are expressly allowed to use apprentices on these projects as long as they are working alongside an EVITP-certified electrician. EVITP requirements thus support continued job access and career training for disadvantaged workers entering electrical apprenticeship programs.

In sum, the following points are emphasized for the Commission’s consideration:

1. EVITP training and certification should be a requirement under the CALeVIP program for reasons of safety, performance, reliability, risk and liability reduction.
2. Where State, local, public and privately funded projects exist, local jurisdictions should have the ability to establish more comprehensive training and certification requirements.

3. To ignore mandated training and certification wastes the resources and funding already invested in the well-established EVITP program, putting the public, workers, first responders, property, and public acceptance of clean transportation at further and greater risk.
4. Lack of required training and voluntary certification requirements create a disincentive for contractors with well-trained workforces to compete for jobs against contractors with less-skilled workforces.
5. A significant increase in EVSE installation volume is bringing in additional contractors and electricians who have less skill and experience and need the advanced training even more. Standardized requirements are needed to ensure that all installers have adequate training.
6. A uniform and consistent policy maximizes safety, improves performance and reliability, increases EV acceptance, and provides all electrical contractors with the same incentive to train their electricians.

Imposing such a requirement now will not delay EVSE installations. Not only are there more than enough currently certified EVITP electricians to perform the coming EVSE work, substantially more installers can become EVITP-certified in a relatively short time. EVITP certification and EVITP contractor approval is neither a burdensome nor lengthy process. It requires 20 - 24 hours of training and testing, and can be provided by community colleges, utility training centers and apprenticeship training centers. On the other hand, delaying such a requirement will encourage contractors with inadequately skilled workers to enter the EVSE installation market, leading to greater risks for all concerned.

The Commission is respectfully urged to require EVITP for its EVSE incentive programs without delay. EVITP is a well-established, well-vetted program that has already been thoroughly evaluated by the CPUC and numerous local agencies. The time is now for the Commission to act and include it as a requirement for CEC incentive programs.

Sincerely,



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